

Analytical synthesis of functional low-order observers

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Abstract

© 2015, Pleiades Publishing, Ltd. Simultaneous estimation of several linear combinations of the state variables of a multiple input-multiple output dynamical system is considered. A method for decomposing the state vector into several components is proposed such that only some of these components are needed to reconstruct the desired vector function. An algorithm for the analytical synthesis is described that yields a functional observer of the minimum possible order. The procedure for computing the observer coefficients is reduced to a modal control problem. The proposed method is based on the matrix canonization technique.

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